

**630    INSTALLATION REQUIREMENTS – CONDUIT FOR FIBER OPTIC CABLE.**  
**(REV 10-20-04) (FA 8-18-05) (1-06)**

SUBARTICLE 630-3.1.1 (Page 688) is deleted and the following substituted:

**630-3.1.1 Fiber Optic Cable Conduit:** Prevent the ingress of water, dirt, sand, and other foreign materials into the conduit prior to, during and after construction. Exclude water and debris from buried conduit and from the top riser assembly of aboveground conduit using a foam-sealing material, rubber plug, or other device designed for this application and approved by the Engineer. Use a UV-rated flexible conduit to protect the cable from the top of the conduit riser to the span messenger where the cable is to be lashed.

Ensure that the conduit fill ratio (outer cable diameter to inner conduit/duct diameter) does not exceed 50%.

Install the conduit system so the fiber optic cable maintains a minimum bend radius of 20 times the cable diameter.

Install the conduit as shown in the plans. Provide all fittings and incidental materials necessary to construct a complete installation. Use approved methods for connecting inner duct or conduit within or between plowed portions, trenched portions, and bored portions. Submit the conduit manufacturer's coupling method and material to the Department's Project Manager for approval.

**630-3.1.2 Fiber Optic Cable Locate Wire:** Install locate wire in the trench or bore with all underground conduits. Do not install locate wire in a conduit with fiber optic cable. Ensure the locate wire provides end-to-end electrical continuity for electronically locating the underground conduit system.

Do not run locate wires into field cabinets. Terminate locate wires at the first and last pull boxes in the conduit run. Ensure that wire termination occurs only at the top of a pull box.

In a trenching operation, install the locate wire no more than 3 inches [75 mm] above the conduit. Ensure that the locate wire enters all access points, and that a minimum of 10 feet [3 m] of slack locate wire is coiled and neatly stored at each access point to allow for future additions or repairs to the conduit route marking system.

In a boring operation, install the locate wire in an encasement.

Core-drill the access point wall at the conduit diameter and at the location indicated in the plans. After placement, apply a nonshrink grout or other acceptable material around the conduit/locate wire to seal the hole.

Perform continuity tests and insulation resistance tests on all locate wires. Provide the Engineer with all test results. If the installation of the locate wire is not continuous, replace the locate wire at no additional cost.

Make locate wire splices in a flush grade-level pull box. Ensure that locate wire splices are waterproof and suitable for direct burial. Ensure that locate wire splices at the pull box meet NEC requirements. Ensure that locate wire splices include a mechanical crimp connection with a butt sleeve, an oxide-preventing aerosol lacquer, mastic electrical splicing tape, and standard electrical tape using methods and materials approved by the Engineer. At the completion of the installation, provide the Engineer with as-built drawings that document all splice locations.

SUBARTICLE 630-4.2 (Page 690) is deleted and the following substituted:

**630-4.2 Furnish and Install:** The Contract unit price per foot [meter] of Conduit, furnished and installed, will include furnishing all hardware and materials as specified in the Contract Documents, and all labor, trenching, backfilling, and restoration materials necessary for a complete and accepted installation.

Payment for conduit placed in the ground or used on bridge decks will be based on the horizontal path of the installed conduit as measured in a straight line between the centers of pull boxes, cabinets, poles, etc. No allowance will be made for sweeps or vertical distances above or below the ground or the bridge deck.

Due to conditions which may exist on the project site, the Contractor may furnish conduit in variable lengths.

Furnishing and installing the locate wire is included in the cost of the conduit.

Conduit used for Fiber Optic Cable includes the cost of furnishing and installing the locate wire and the cost of conducting the continuity test and the insulation resistance test.

SUBARTICLE 630-4.4 (Page 690) is deleted and the following substituted:

**630-4.4 Install:** The Contract unit price per foot [meter] of Conduit, installed, will include all miscellaneous hardware and materials, labor, trenching, backfilling, and restoration materials necessary for a complete and accepted installation.

The Engineer will supply conduit in sections with one coupling per section and elbows as required.

Payment for conduit placed in the ground or used on bridge decks will be based on the horizontal path of the installed conduit as measured in a straight line between the centers of pull boxes, cabinets, poles, etc. No allowance will be made for sweeps or vertical distances above or below the ground or the bridge deck.

Installing the locate wire is included in the cost of the conduit. Conduit used for Fiber Optic Cable includes the cost of installing the locate wire and the cost of conducting the continuity test and the insulation resistance test.